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Enhanced Laser Printing *ELP*

Administrator Guide – Barcode and OMR

Revision 8.40

For

MS Windows NT based platforms incl.cluster and terminal server
HP Unix, True64, Linux, Solaris, VMS, AS/400 and AIX

As firmware extension for variouse laser printer
As applience box for Lan2Lan and Lan2USB upto 56 ports

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Contact and support address

Please open the PPAdmin software -> License Tab -> about, or start the convert.exe software without any argument.

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Intelligent Barcode Emulation

This function is always turned on by default. Due to licensing issues, the functionality could be turned totally off, once a valid license key is provided.

Presentation

The *W-ELP* Server Print Processor emulates all 1 dimensional and the 2 dimensional PDF 417 barcodes, UPS Maxicode out of the JetMobile™ BarDIMM Version 2.0 and Datamatrix from version 3.0. If you need a more detailed manual, please contact your local distributor. Their address is listed in the info-box at the license tab of the PPADMIN software.

The *ELP* does support more than 60 bar code formats, from the simplest to the most complex system (interleaved, triple checksum, etc...).

Each of these barcodes can be defined in any height from 1mm to 33 cm with 1/72 inch increments, bar widths can be defined in 1/600 inch units, code value can be printed as text together with code in many different embeddings with 20 different scalable fonts. As a result, you can generate million of kinds of bar code formats from the module!

NOTES:
1. Printing barcodes can only be performed within PCL 5 and with a special setup also with postricpt printing files.
2. ELP also offers an emulation for the Kyocera way of printing barcodes using their printer language called PreScribe.
3. In this manual, the escape code is indicated as <Esc>. Those five characters must not be entered as individual symbols, but must be replaced with the unique character of ASCII value 27.

The intelligent barcode functions are not made of scalable fonts. They trace the font alike PCL5 sequences of the data stream. The Hewlett-Packard defined typeface numbers from 24600 to 24800 activate the intelligence. All data mapped to one of those special fonts is analysed and converted into bar code directly by the emulation.

Implementation

If you want to print special characters (ASCII code < 32) with those bar codes, a "Transparent Print Data" PCL sequence (Esc&p#X) must follow immediately the font selection sequence. This is the only way to know how many characters have to be printed.

The end of bar code data is determined according to the bar code type:

* Bar code data is numeric only: ended by space/CR/LF/FF/Escape code.
* Bar code data is alphanumeric: ended by CR/LF/FF/Escape code.

If you want to print binary information in the barcode, please use the Esc&p#X Length definition sequence, explained right before.

There are some example files provided for your tests, see page **Fehler! Textmarke nicht definiert.**.

FONT-LIKE PARAMETERS DESCRIPTION 1-D BARCODES

P parameter Esc(s#p

Control if/how human-readable (caption) text is printed with bar code

0 Use default value
1 Don't print human readable text
2 Print human readable text embedded
3 Print human readable text half embedded
4 Print human readable text under code
5 Print human readable text above code
6 Print human readable text half above code
7 Print human readable text full embedded above code

Specials:	Add	10	to print UPC/EAN/JAN checksum middle left rather than bottom left of bar code.
	Add	10	to print start & end * characters with 39 bar code text
	Add	20	to format French and German postal barcodes
	Add	100	to print checksum character with text.
	Add	124	to print the German Post barcode

Exception**:** For Australia 4State barcodes, the p parameter specifies if the customer information is digits

0 Encode customer information with N table
1 Encode customer information with C table

H parameter ...#h
Controls what font is used for the human-readable (caption) text

Format: *CBA*, numeric value, where

C: Style 0 Use Default (Bold)
1 Use Regular
2 Use Italics
3 Use Bold
4 Use Bold Italic
> 9 then the human readable text is printed in a fixed size in mm. The height is the value dived by 10. So if you want to print a 5 mm text height in bold italic, use 54

B: Size 0 Use automatic font size
9 External, use macro 28745 to call readable text any time after barcode is printed. You can set position and size, best in HP GL2 commands.

A: Typeface 0 Use Courier to print text (default)
1 Use Letter Gothic to print text
2 Use Univers to print text
3 Use Univers Condensed to print text
4 Use CG-Times to print text
5 Use OCR-B to print text (great with UPC/EAN)

Example: text in Univers Bold Italic, automatic size: Esc(s402H

V parameter ....#v
Short bar height in points (1/72 inch). Same unit as fonts. Minimum sizes apply.
Example: Bar code in point size 87: Esc(s87V

Non Standard is the possibility for a negative v parameter.
PCL-Barcodes: This was especially entered for an easier Kyocera barcode handling. The PreScribe language does print the barcodes from the actual position downwards, but the industry standard is upwards.
So if a negative size is entered, the barcode is also printed downwards.
PostScript-Barcodes: As the postscript data streamis not really parsed, the page and print orientation settings are not really interprated. Therfor the barcode output from standard SAP is mirrored. Using a negative height, the barcode printout is mirrired back.

B parameter ....#1,#2[,#3,#4]b
Bar Widths

#1, bar width, first (thin) width in dots (1/600 inch)
#2, bar width, second width in dots (1/600 inch)
Only for EAN, UPC and Code 128 Barcodes please extend:
#3, bar width, third width in dots (1/600 inch)
#4 bar width, fourth width in dots (1/600 inch)

Example: Thin bars 4 dots, thick bars 8dots: Esc(s4,8B

S parameter ....#1,#2[,#3,#4]s
Space Widths

#1, space width, first (thin) width in dots (1/600 inch)
#2, space width, second width in dots (1/600 inch)
Only for EAN, UPC and Code 128 Barcodes please extend:
#3, space width, third width in dots (1/600 inch)
#4 space width, fourth width in dots (1/600 inch)

Example: Thin spaces 4 dots, thick spaces expand 4 dots: Esc(s4,8,12,16S

Note: The **s** and **b** parameters should be specified together. If this is not possible then please specify only the **s** parameter

T parameter .....#T

24600,	UPC-A	24620,	EAN/JAN-8
24601,	UPC-A +2	24621,	EAN/JAN-8 +2
24602,	UPC-A +5	24622,	EAN/JAN-8 +5
24610,	UPC-E	24630,	EAN/JAN-13
24611,	UPC-E +2	24631,	EAN/JAN-13 +2
24612,	UPC-E +5	24632,	EAN/JAN-13 +5
24640,	25 interleaved	24650,	25 industrial
24641,	25 interl + CHK	24651,	25 indust + CHK
24642,	German Postal 25 Leitcode 13	24660,	25 matrix
24643,	German Postal 25 Identcode 11	24661,	25 matrix + CHK
24670,	Code 39 (3of9)	24700,	128 autoswitch
24671,	Code 39 + CHK	24701,	128 A (see Page 11)
24672,	39 encode space before/after data	24702,	128 B (see Page 11)
24673,	39+CHK encode space b/a data	24703,	128 C (obsolete, Page 11)
24680,	39 extended	24704,	128 C (see Page 11)
24681,	39 extended + CHK	24710,	UCC-128
24675,	Danish PTT 39 barcode	24720,	EAN 128
24676	French Postal 39 A/R		
24770,	ZIP+4 POSTNET 5	24690,	93
24771,	ZIP+4 POSTNET 9	24691,	93 extended
24772,	ZIP+4 POSTNET 11		
23591,	USPS ZEBRA	24750,	CODABAR
24644,	USPS 25, 11 digits Tray Label	24751,	CODABAR +CHKmod16
24645,	USPS 25, 8 digits Sack Label		
24785,	Australia 4 State 37-CUST	24760,	MSI
24786,	Australia 4 State 52-FF-MET	24761,	MSI +CHK10
24787,	Australia 4 State 67-FF-MET	24762,	MSI +CHK10+CHK10
24788,	Australia 4 State FCC-45 REPLY	24763,	MSI +CHK11+CHK10
24780,	Singapore 4 State	24805	Netherlands Post Barcode
		24806	RM4SCC of British Post

Non standard JetMobile Barcodes:

24823	BCUPS	Decoding the old UPS Barcode 1Z....
24801	BCPZN	German Pharma Zentral Number
24802	BCFIM	US Postal Code FIM Barcode
24803	BCEANVELO	EAN Velosity

24804	BCUPC128	UPC 128 shipping container
24810*	BCCODE11	Code 11
24811*	BCCODE11_C	Code 11 Modulo 10
24812*	BCCODE11_CK	Code 11 Modulo 10 and 11
24817	BCCODE11	Code 11
24818	BCCODE11_C	Code 11 Modulo 10
24819	BCCODE11_CK	Code 11 Modulo 10 and 11
24805*	BCKIX	Netherlands Post Barcode
24824	Australia 4 State 37-Routing	
24821	Australia 4 State 37-REDI	
24822	Australia 4 State 67-FF-MAN	

* old version: Those parameters should not be used anymory, instead use the 24805,24806 or 24817 to 24819

Note: **Barcode parameters must be combined in a unique PCL font escape sequence.**
e.g.: <ESC>(s4p305h24v7,21s7,21b24670T

Print Extended Characters and leading spaces

Some of the barcodes can print the full ASCII table from 1 to 127. In regular mode, some of the characters below 33 may cause the *ELP* software to print the code up to this character and maybe even start after the character with a new barcode definition. In order to avoid this, you can add after the full Esc Sequence for the code <27>&p####X. The numeric value ### does define the length of the message information in Bytes.
Our demo file on our home page does give an example for the Code 128.

2of5 interleave Autoajustment

Depending if check sum is used, this barcode needs always an odd or even amount of digits. If this is not the case, you may automatically add a leading 0 to mach the barcode requirements. The ini-file key 2of5AutoLenAjustment can be used to turn this non standrad function on.

Code 128 Control Codes

Code 128 has five non-data special control codes, called FUNCTION CODES, and 2 control codes to switch from one 128 set (A, B or C) to another one. The switching control codes are used by *ELP* Software to force one 128 set. As an example, the string "123456" can be printed with both sets A, B and C. Inserting a character with ASCII value = 134 at the beginning of the string will force to use the set B of code 128.

Note that both Code 128 Autoswitch and EAN 128 analyse the data and optimise the barcode length by switching automatically between sets A B and C. EAN128 and UCC-128 already include the FNC1 code as the first character: you should not send it with the data.

Special control codes are inserted by passing the following special decimal characters in the bar code:

133 = CODE A	129 = FNC 1
134 = CODE B	130 = FNC 2
135 = CODE C	131 = FNC 3
128 = SHIFT	

The typeface number 24703 is obsolete to send to LJ 4000. However, the *ELP* emulation is able to handle both sequences 24703 and 24704.

2-D Barcode PDF-417

The PDF417 is a high-density 2D barcode created by Symbol Technology and now an ANSI/AIM USA standard. This barcode is composed of a stack of rows with small black rectangles arranged in columns. The number of rows and columns can be user defined or set automatically to fit a ratio (2:3 is the most common ratio).

PDF417 features built-in error correction capability, automatic data compression and full ASCII character set. It can encode up to 1848 characters of information per barcode, based on the compression level achieved. PDF 417 exists in two modes: ASCII and Binary modes. ASCII mode has a better data density than the binary mode (maximum 106 versus 177 bytes per cm^2) and can encode much more data than the binary mode (maximum 1848 bytes versus 1108 bytes).
PDF417 has extensive error correction capabilities.

PDF417 barcodes are read with laser scanner and CCD cameras.

Number of rows (min/max):	3/90
Number of columns (min/max):	1/30

There are many options for the PDF-417 symbol, activated using the p, b, and s parameters of the font-like PCL sequence. Please read carefully the parameters descriptions in the **FONT-LIKE PARAMETERS DESCRIPTION** chapter.

Note: Some parameters override some other (i.e., the size ratio and line/rows definitions override each other). The last option in the escape sequence has the priority.

FONT-LIKE PARAMETERS DESCRIPTION

P parameter Esc(s#p

1 to 8:	defines the ECC level
1000 to 1400:	defines the ECC level based on the size of the codeword relative to the data size, in percent (0 to 400). The matching Ecc level will automatically be calculated

B parameter .....#1,#2,#3[,#4]b

#1,	Maximum number of columns for the PDF symbol
#2,	Maximum number of lines for the PDF symbol
#3,	=1 #1 and #2 are the mandatory size for the PDF symbol =0 or not specified: #1 and #2 are maximum size (default)
#4,	=1 The PDF-417 symbol is truncated on its right side =0 The PDF-417 symbol is not truncated (default)

Example: 8 columns, 10 lines mandatory size, none truncated:
8,10,0

S parameter ....#1,#2[,#3,#4]s Symbol format parameters

#1, X parameter for the symbol X/Y size ratio (default: 2 for 2/3)
#2, Y parameter for the symbol X/Y size ratio (default: 3 for 2/3)
#3, Symbols black/white module height (1 to 10). Unit=minimum module width (default=3)
#4, For future use
Example: square PDF, minimum module width: 1,1,1

T parameter ....#T (Typeface): Select Bar Code System
24850

2-D Barcode DataMatrix

Data Matrix is a high density 2-D matrix code developed by RVSI – Acuity CiMatrix that can encode a lot of information in a very small space. The Data Matrix symbology has extensive error correction capabilities using ECC200 error checking. A Data Matrix symbol can store between one and 3116 numeric or 2335 alphanumeric characters, and is scalable between a 1-mil square to a 14-inch square.

Since the overall size of the Data Matrix symbol is infinitely scaleable, the Data Matrix symbols can be read at virtually any distance, given the right combination of Data Matrix size and reading equipment.

ELP can scale the code with the definition of the small black square height/width. By default *ELP* will automatically optimize the encoding (binary, text, digits) by analyzing the data on the data.

Note: Postscript is NOT integrated!

FONT-LIKE PARAMETERS DESCRIPTION

B parameter Esc(s#B The size of one small square in dots. 600 dots are 1 inch or 25.4 cm. The default size is 1mm.
This sequence is optional and NOT industry standard compatible

T parameter Esc(s24820T

The following sequences are not industry compatible, but enhance the product:

P parameter Esc(s#P Default is 0, but once set to 1 the Tilde character becomes a total new meaning:

~~ The Tilde sign itself
~X Is used to represent character values from 0 to 26. Replace the X like in the following example
~@ = means character ascii 0,
~A= means character 1,
~B=means character 2,
~C=means character 3 ...
~1 Represents the character FNC1. When FNC1 appears in the first position (or in the fifth position of the first symbol of a Structured Append), it will indicate that the data conforms to the UCC/EAN Application Identifier standard format.

~2 It is used to represent Structured Append. Structured Append is used to link information from several symbols in a secuence. The ~2 must be followed by 3 additional bytes. The first 4 bits of the first byte identify the position of the particular symbol in the secuence . The last 4 bits identify the total number of symbols in the secuence. The second and third byte are used as a file identifier can have a value between 1 and 254 (up to 254*254=64516 identifiers). See Data Matrix Specification for more information about this (ISO 16022).

~3 This character are only allowed in the first position of the symbol. It indicates that the data contains commands for the barcode reader.

~5 and ~6: These characters are only allowed in the first position of the symbol. If ~5 is used the header []> ascii30 ascii05 ascii29 will be transmitted by the barcode reader before the data in the symbol and the trailer ascii30 ascii04 will be transmitted after the data. If a ~6 is used , the header []> ascii30 ascii05 ascii29 will be transmittedby the reader before the data and the trailer ascii30 ascii04 will be transmitted afterwards.

~7NNNNNN specifies the Extended Channel to be used, where NNNNNN is a value between and 000000 - 999999.
For example: ~7000010 means Extended Channel 10 . Extended channel is used for using other character sets other than ascii. See Data Matrix Specification for more information about this (ISO 16022).

~dNNN represents the ascii character encoded by the 3 digits NNN. For exmaple, ~d065 represents the character 'A'.

H parameter Esc(s#H Default is 0 and automatc encoding is used. If you want tio use a special encodinh method, then those encodingh values can be used:

10 - ASCII	11 - C40	12 – TEXT
13 - BASE256 3	14 - NONE	15 - AUTO

So a typical selection escape sequence will look like that:

Esc(s20b24820T

Note: The old 24820 sequence for austrailan code was moved to 24824.

2-D Barcode UPS MaxiCode™

The MaxiCode barcode is a 2D barcode that consists of 884 hexagons surrounding a bull's-eye finder pattern. One bit of information is encoded by one hexagon. Up to 100 characters of information can be encoded in one square inch, which is the approximate fixed size of such a barcode. The MaxiCode symbology includes built-in error correction capability, automatic data compression and full ASCII character set.

Postscript is integrated but was never tested!

MaxiCode has been created by UPS and endorsed by AIM (Uniform Symbology Specification MaxiCode) as a multi-purpose EDI-ready two-dimensional barcode.

UPS uses MaxiCode to encode all information about the parcels, to provide a faster and better service to its clients. MaxiCode data is a string made of a header, the ANSI message and an End Of Transmission code.

FONT-LIKE PARAMETERS DESCRIPTION

S parameter Esc(s#.#,#.#S the first parameter set the X scaling and the second the Y scaling ration. Default: 4.3,4.0
This sequence is optional and NOT industry standard compatible

T parameter Esc(s24800T

Error messages : On any error message the error.log file in the forms directory does contain the detailed text description of the problem. See also error messages below.

Field name description	**size**	**Type**	**Req.**
The label number	any	numeric	y
Field sperator	1	comma	Y
the number of labels for the shipment	any	numeric	Y
Field sperator	1	comma	Y
The mode. (4 and 5 are implemented, but not released, release on request) 2 for domestic US shipments, 3 for international shipments	1	2 or 3	Y
Field sperator	1	comma	Y
The Postal code For mode 2 up to 9 digits For mode 3 up to 6 alpha numerical values	 9 6	 numeric alpha num	Y

Field sperator	1	comma	Y
Country code see below the table	3	numeric	Y
Field sperator	1	comma	Y
Class of service (See UPS description)	3	numeric	Y
Field sperator	1	comma	Y
ANSI Message Header	3	])>	Y
Seperator \RS can be coded as Ascii 30 or hex 1E	1 | 3	\RS	Y
Transportation Data Format Header \GS can be coded as Ascii 29 or hex 1D	5 | 7	01\GS96	Y
UPS Tracking Number	< 12	alpha num	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
SCAC	4	USPN	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
UPS Shipper Number	6	alpha num	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Julian Day of Pickup	3	num	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Shipment ID	0-30	alpha num	O
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Package n/x 1-3/1-3	< 7	num	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Package Weight	3	num	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Address Validation	1	Y | N	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Ship To Address	< 36	alpha num	O
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Ship To City	< 21	alpha num	Y
Seperator \GS can be coded as Ascii 29 or hex 1D	1 | 3	\GS	Y
Ship To State	2	alpha	Y
End Of Format character	1 | 3	\RS	Y
End Of Transmission \EOT can be also coded as hex or Ascii 04	1 | 4	\EOT	Y

Please consult the latest " Guide to Bar Coding With UPS OnLine For customers Generating Bar Code Labels"

Note: The secondary message can not be longer than 84 characters. Therefore, the destination address length must be truncated if required if the total length for the secondary message is greater than 84 characters. That destination address is anyway optional in the MaxiCode data. If data is too long, BarDIMM will not print the MaxiCode and prints an error message.

Example:

```
<Esc>(s24800T1,1,2,152382802,840,001,[)>\RS01\GS96995011234\GS840\
GS025\GS1Z07000168\GSUPSN\GSWX9031\GS272\GS\GS1/1\GS15\GSY\GS123\F
S\300\\GS\GSAK\RS\EOT<Esc>(s0p10h12vbs4099T
```

The implementation of the Country code:
This code mus be a 3 digit numerical entry, however ELP supports also the full name of the country or the 2 and 3 bytes short name:
So instead of the numerical value you also may use those strings:

Fullname	**2 char**	**3 char**	**num**
Afghanistan, Islamic State of	af	afg	004
Albania	al	alb	008
Algeria	dz	dza	012
American Samoa	ds	asm	016
Andorra, Principality of	dd	and	020
Angola, Republic of	do	ago	024
Anguilla	ai	aia	660
Antartica	aq	ata	010
Antigua and Barbuda	ag	atg	028
Argentina	ar	arg	032
Armenia	am	arm	051
Aruba	aw	abw	553
Australia	au	aut	040
Austria	at	aut	031
Azerbaijan	az	aze	031
Bahamas	bs	bhs	044
Bahrain	bh	bhr	048
Bailiwicks of Guernsey	gg	?	?
Bangladesh	bd	bgb	050
Barbados	bb	brb	052
Belarus	by	blr	112
Belgium	be	bel	056
Belize	bz	blz	84
Benin	bj	ben	204
Bermuda	bm	bmu	60
Bhutan	bt	btn	64
Bolivia	bo	bol	68
Bosnia and Herzegowina	ba	bih	70
Botswana	bw	bwa	72
Bouvet Island	bv	bvt	74
Brazil	br	bra	76
British Indian Ocean Territory	io	iot	86
Brunei Darussalam	bn	brn	96

Bulgaria	bg	bgr	100
Burkina Faso	bf	bfa	854
Burundi	bi	bdi	108
Cambodia Kingdom of	kh	khm	116
Cameroon	cm	cmr	120
Canada	ca	can	124
Cape Verde	cv	cpv	132
Cayman Islands	ky	cym	136
Central African Republic	cf	caf	140
Chad	td	tcd	148
Chile	cl	chl	152
China	cn	chn	156
Christmas Island	cx	cxr	162
Cocos (Keeling) Islands	cc	cck	166
Colombia	co	col	170
Comoros	km	com	174
Congo	cg	cog	178
Congo The Democratic Republic of the	cd	cod	180
Cook Islands	ck	cok	184
Costa Rica	cr	cri	188
Cote D'Ivoire (Ivory Coast)	ci	civ	384
Croatia (Hrvatska)	hr	hrv	191
Cuba	cu	cub	192
Cyprus	cy	cyp	196
Czech Republic	cz	cze	203
Czechoslovakia (Officially deleted)	cs		0
Denmark	dk	dnk	208
Djibouti	dj	dji	262
Dominica	dm	dma	212
Dominican Republic	do	dom	214
East Timor	tp	tmp	626
Ecuador	ec	ecu	218
Egypt	eg	egy	818
El Salvador	sv	slv	222
Equatorial Guinea	gq	gnq	226
Eritrea	er	eri	232
Estonia	ee	est	233
Ethiopia	et	eth	231
Falkland Islands (Malvinas)	fk	flk	238
Faroe Islands	fo	fro	234
Fiji	fj	fji	242
Finland	fi	fin	246

France	fr	fra	250
France metropolitan	fx	fxx	249
French Guiana	gf	guf	254
French Polynesia	pf	pyf	258
French Southern Territories	tf	atf	260
Gabon	ga	gab	266
Gambia	gm	gmb	270
Georgia	ge	geo	268
Germany	de	deu	276
Ghana	gh	gha	288
Gibraltar	gi	gib	292
Greece	gr	grc	300
Greenland	gl	grl	304
Great Britain	gb	gbr	826
Great Britain (iso 3166 code is gb)	uk	gbr	826
Grenada	gd	grd	308
Guadeloupe	gp	glp	312
Guam	gu	gum	316
Guatemala	gt	gtm	320
Guinea	gn	gin	324
Guinea-Bissau	gw	gnb	624
Guyana	gy	guy	328
Haiti	ht	hti	332
Heard and MC Donald Islands	hm	hmd	334
Holy See (Vatican City State)	va	vat	336
Honduras	hn	hnd	340
Hong kong	hk	hkg	344
Hungary	hu	hun	348
Iceland	is	isl	352
India	in	ind	356
Indonesia	id	idn	360
Iran Islamic Republic of	ir	irn	364
Iraq	iq	irq	368
Ireland	ie	irl	372
Isle of Man	im		0
Israel	il	isr	376
Italy	it	ita	380
Jamaica	jm	jam	388
Japan	jp	jpn	392
Jersey	je		0
Jordan	jo	jor	400
Kazakhstan	kz	kaz	398

Kenya	ke	ken	404
Kiribati	ki	kir	296
Korea Democratic People's Republic of	kp	prk	408
Korea Republic of	kr	kor	410
Kuwait	kw	kwt	414
Kyrgyzstan (Kyrgyz Republic)	kg	kgz	417
Lao People's Democratic Republic	la	lao	418
Latvia	lv	lva	428
Lebanon	lb	lbn	422
Lesotho	ls	lso	426
Liberia	lr	lbr	430
Libyan Arab Jamahiriya	ly	lby	434
Liechtenstein	li	lie	438
Lithuania	lt	ltu	440
Luxembourg	lu	lux	442
Macau	mo	mac	446
Macedonia the former Yugoslav Republic of	mk	mkd	807
Madagascar Republic of	mg	mdg	450
Malawi	mw	mwi	454
Malaysia	my	mys	458
Maldives	mv	mdv	462
Mali	ml	mli	466
Malta	mt	mlt	470
Marshall Islands	mh	mhl	584
Martinique	mq	mtq	474
Mauritania	mr	mrt	478
Mauritius	mu	mus	480
Mayotte	yt	myt	175
Mexico	mx	mex	484
Micronesia Federated States of	fm	fsm	583
Moldova Republic of	md	mda	498
Monaco	mc	mco	492
Mongolia	mn	mng	496
Montserrat	ms	msr	500
Morocco	ma	mar	504
Mozambique	mz	moz	508
Myanmar	mm	mmr	104
Namibia	na	nam	516
Nauru	nr	nru	520
Nepal	np	npl	524
Netherlands	nl	nld	528
Netherlands Antilles	an	ant	530

Neutral Zone (Officially deleted)	nt		0
New Caledonia	nc	ncl	540
New Zealand	nz	nzl	554
Nicaragua	ni	nic	558
Niger	ne	ner	562
Nigeria	ng	nga	566
Niue	nu	niu	570
Norfolk Island	nf	nfk	574
Northern Mariana Islands	mp	mnp	580
Norway	no	nor	578
Oman	om	omn	512
Pakistan	pk	pak	586
Palau	pw	plw	585
Palestine	ps		350
Panama	pa	pan	591
Papua New Guinea	pg	png	598
Paraguay	py	pry	600
Peru	pe	per	604
Philippines	ph	phl	608
Pitcairn	pn	pcn	612
Poland	pl	pol	616
Portugal	pt	prt	620
Puerto Rico	pr	pri	630
Qatar	qa	qat	634
Reunion	re	reu	638
Romania	ro	rom	642
Russian Federation	ru	rus	643
Rwanda	rw	rwa	646
Saint Kitts and Nevis	kn	kna	659
Saint Lucia	lc	lca	662
Saint Vincent and the Grenadines	vc	vct	670
Samoa	ws	wsm	882
San Marino	sm	smr	674
Sao Tome and Principe	st	stp	678
Saudi Arabia	sa	sau	682
Senegal	sn	sen	686
Seychelles	sc	syc	690
Sierra Leone	sl	sle	694
Singapore	sg	sgp	702
Slovakia (Slovak Republic)	sk	svk	703
Slovenia	si	svn	705
Solomon Islands	sb	slb	90

Somalia	so	som	706
South Africa	za	zaf	710
South Georgia and the South Sandwich Islands	gs	sgs	239
Soviet Union (See Russian Federation)	su		
Spain	es	esp	724
Sri Lanka	lk	lka	144
St. Helena	sh	shn	654
St. Pierre and Miquelon	pm	spm	666
Sudan	sd	sdn	736
Suriname	sr	sur	740
Svalbard and Jan Mayen Islands	sj	sjm	744
Swaziland	sz	swz	748
Sweden	se	swe	752
Switzerland	ch	che	756
Syrian Arab Republic	sy	syr	760
Taiwan Province of China	tw	twn	158
Tajikistan	tj	tjk	762
Tanzania United Republic of	tz	tza	834
Thailand	th	tha	764
Togo	tg	tgo	768
Tokelau	tk	tkl	772
Tonga	to	ton	776
Trinidad and Tobago	tt	tto	780
Tunisia	tn	tun	788
Turkey	tr	tur	792
Turkmenistan	tm	tkm	795
Turks and Caicos Islands	tc	tca	796
Tuvalu	tv	tuv	798
Uganda	ug	uga	800
Ukraine	ua	ukr	804
United Arab Emirates	ae	are	784
United Kingdom	gb	gbr	826
United Kingdom (iso 3166 code is gb)	uk	gbr	826
United States	us	usa	840
United States minor outlying islands	um	umi	581
Uruguay	uy	ury	858
Uzbekistan	uz	uzb	860
Vanuatu	vu	vut	548
Venezuela	ve	ven	862
Viet Nam	vn	vnm	704
Virgin Islands (British)	vg	vgb	92
Virgin Islands (U.S.)	vi	vir	850

Wallis and Futuna Islands	wf	wlf	876
Western Sahara	eh	esh	732
Yemen	ye	yem	887
Yugoslavia	yu	yug	891
Zaire (see country number 180)	zr		0
Zambia	zm	zmb	894
Zimbabwe	zw	zwe	716

Printing Barcode, Examples

A typical ESC-Sequence to select a particular barcode could be:

<27>(s4p102h40v10,30b10,30s24670T

4p	Readable text below the codes, without start-stop-sign (*)
102h	Readable text in Univers normal
40v	The code size is 40pt; 40 / 72 * 2,54 cm
10,30s/b	The small stroke/space bar is 10 dots, the wide ones are 30 dots 10 / 600 * 2,54 cm
24670	Use Code 39 (3of9)

Normally you want to print the code at a special position in a special orientation and you certainly want to return to the last printing position. Therefore you may need to send the following sequences to the printer:

<27>&fS	Push cursor position (save)
<27>&a5000h2000V	Positioning in 1/720 units per inch
<27>&a90P	Rotate 90 degrees*
<27>(s4p102h40v10,20b10,20s24670T	Select barcode
BARCODEINFORMATION	Barcode information
<27>(10U<27>(sp10hsb4099T	Select any font from PCL font list
<27>&aP	Original printing direction*
<27>&f1S	Pop cursor position (restore)

If you want to print the code in the current print direction, please leave out the *-marked commands.

For further information of the usage of ESC-Sequences please refer to the Hewlett-Packard PCL 5 technical reference manual, which can be download from www.hp.com.

Permanent and secondary fonts switching can be used with barcode fonts. It is highly recommended that a text font is used as primary font, and barcode font as secondary font. (Please refer to your PCL developer's guide for all information on primary and secondary fonts).

SAP Support

ELPs barcode functionality is supported standard by the SAP R/3 software.

- OSS note #5196 lists standard R/3 barcode names and supported device types for printing barcode
- PCL-5 commands for Jetmobile BarSIMM/DIMM are built into the HP device types by SAP
- Modifications are only required for special Barcode types and sizes
- OSS note #45643 lists PCL-5 command details for barcode attribute selection - PCL-5 commands are maintained as « Print Controls » in SPAD
- SE73 transaction lists barcode names and print-controls for every device type
- Barcode on: Print-control SBPxx
- Barcode off (regular font): SBSxx
- A test text is built into R/3: SO10, SAPSCRIPT-BARCODETEST (client 000)

Note: In the early release of the device type, there were a few errors in the escape sequences. It is then recommended to verify the escape sequence syntax in R/3.

It would be nearly a wonder if the barcode size of the predefined print-control would match to your needs. We strongly recommend to copy the control into the user Z-environment and maintain it to your needs.

Tip: Unfortunately the print controls are defined in HEX. Older HP LaserJet manuals do have at the end an ASCII-HEX convertion table! If you cannot get hold of one of those manuals, google the web.

The SAP print controls for OCR-A is SF400 and SF500 for OCR-B.

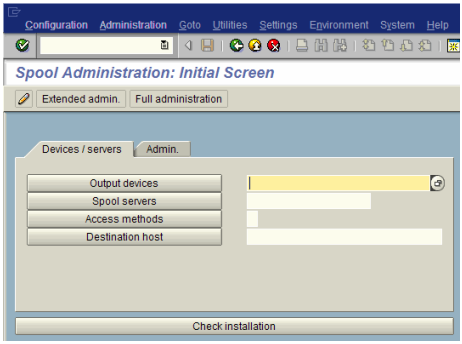
If you would like to get more information about efficient printing from SAP, please have a look on our stethos home page. There we explain the following methods:

1. Save processing speed and network data traffic by using Flash (HD) technology.
2. Use the full printer functionality and even reduce more processing and network traffic by installing the AFE driver.
3. Usage of external SW to generate based upon SAP data in seconds any form.

If you want to know more about SAP Printing Solutions, then please contact the distributore home page See PPAdmin License register INFO.

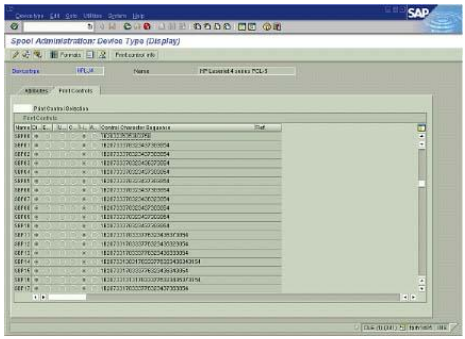
How to define your own barcode type and sizing in SAP

Within SAP the "Spooler administration" transaction (shortcut SPAD) is used for all printer-related settings. Every printer must be defined as an "output device" in SPAD Select SAP Transaction *SPAD* and then click the Full Administration button.



Select the Device Types tab and select the printer that will be printing the barcodes (HPLJ4000, for example). It is maybe wise to copy the standard device type to a new one, The new name should start with a Y opr Z.

Select the green check mark after entry of the *Device Type* to display the *Spool Administration: Device Type* screen, then click on the *Print Controls* tab.



The Print Controls page displays a list of defined print control sequences, each identified by a name. You should always create new sequences again staring with a Y or Z in the name. Select the hex notation and enter the complete barcoide select sequence.

Tip: Open notepad or DOS Edit, type the ASCII part in, save the file, open it in any hex editor and copy the hex text over. The Escape sign is hex 1B. Please find in the next chapter also a hex table.
Do the same thing with a deselection Escape Sequence. So you may have now 2 new print controls defined: YBCON and YBCOFF.

Now you are ready to print barcodes using an ABAP report program or a SAPSCRIPT form.

Sample SAPSCRIPT

```
* Variable MY_BARCODE contains the barcode data, including asterisks.
* The & is needed to avoid unwanted spaces or CR/LF characters
/E LINE
/: PRINT-CONTROL YBCON
= &BAR_CODE1&
/: PRINT-CONTROL YBCOFF
```

Sample ABAP Program:

```
DATA: MY_BARCODE(4) VALUE `WELP'
NEW-PAGE PRINT ON IMMEDIATELY `X'.
FORMAT COLOR OFF INTENSIFIED OFF.
* If the barcode is the first element on the page, the following Write
* statement is needed (otherwise you get a date in the first print
* control.
WRITE:/
* Turn on the barcode font, print the data, and switch back to the
* printer's default font. Be sure to use NO-GAP to avoid unwanted
* characters or CR/LF.
PRINT-CONTROL FUNCTION `YBCON'
WRITE: MY_BARCODE NO-GAP
PRINT-CONTROL FUNCTION `YBCOFF'
* Add a Write statement to prevent insertion of CR/LF into the barcode.
WRITE:/
```

Printing Barcodes with SAP using Postscript

As ELP is not parsing any Postscript data stream, the barcode command needs to be replaced by the proper PCL sequence. Once the ELP key BarcodesPostscript=ON is set, ELP also parses the Postscript stream and searches for the PCL sequences (see printing barcodes in Postscript) replaces then and writes out the barcode using Postscript sequences.

Please find an example how to setup an ini.file which searches for an SAP Barcode command and replaces it to the proper PCL command, so even a change of the print-controls is not needed.

```
[GLOBAL]
BarcodesPostScript=ON
ELP_Max_Heap=10000000000

[Barcode ein]
search_Binary=(|BCODE39 SB V36 C0 T1 P2 L1|~
; see nagative point size in order to mirror the output back
replace_Binary=\x1B(s4p-36v8,24s8,24b24670T

[Barcode aus]
search_Binary=~)s\x0D\x0A
search_Binary=~)s\x0A
replace_Binary=\x0D\x0A
```

Barcode Samples

Code 39:

EAN 13 Addon 2

Code 128

2of5 interleaved

PDF-417

Codabar

UPC E

Code 39 extended

EAN 128

Enhancements compared to the JetMobile™ BarDIMM 2.0

If Parameter S is only given, B will be assumed to be the same. The original Product will keep the standard values, if S parameters are different, it assumes the other way around to adapt the B as well. We do both sides.

The readable text is slightly different, but we think more precisely positioned.

The readable text of the German Post office barcode is with squares instead of simple dots.

Code 128: If there is a specific code selected like CodeA, but the data needs a character out of another code, like B, then the code will be switched over. The original dimm will end in an error message.

Code 128. Due to the algorithm, the barcodes might look different. In such cases, the coded information will be the same! Compare EAN128 with 987654321 this emulation will generate a much shorter code.

For EAN 8 and 13, you can print the first country digit also using by adding to the P parameter 10, in the middle of the barcode.

The readable text can also be top embedded and half embedded! Simply use p parameter 6 and 7.

For the Australia 4 state we use strictly the original Code from the Post. Therefore the P parameter is ignored. Code date is 5th March 1999

For the Australia 4 the H parameter can be set, then the P parameter will be set to printing readable text under barcode. Dito Singapore 4 state.

Singapore 4 state: The barsimm is not checking the user data correctly. Either they are 6 digits or 4 characters 0..9 or A..Z

Danish post barcode: The original implementation is not checking any length, nor the constant of the data.

Postscript support

Barcodes in Postscript data streams

Origionally the barcodes are only supported within PCL 5 dats streams. However Version 7.1k was enhanced to print also barcodes the intelligent way within Postscript data streams. In order to teach ELP to search also the PostScript print files, the key BarcodesPostScript =ON needs to be set in the section GLOBAL or in the user and or primnter named sections.

The implementation was made quite easy, the exact same Sequences are used for adressing the barcodes as within PCL. Also the Escape sequence comes first and then the user information.

The user data ends with the next Carriage Return Sign Ascii 10 (Hex 1A). If the PCL sequence for the length of the user data is used <27>&p…X, then the routine stops after having the provided amount of bytes.

Example:

```
...
490 572 M (Hello)[72 44 28 28  0]xS
<Esc>(s4p24850T1234567890
712 572 M ( )S
...
```

Using the ELP DIMM / MFC or USB stick the key DIMM_PARSE_POSTSCRIPT=ON must be placed in the Golobal Section of the convert.ini.

COBRA Box and Brother emulation for barcodes

ELP is able to emulate the way of barcode printing realized in a Cobra box. Further details can be downloaded from www.cobrasystems.com. The Telepen Barcode is NOT realized.

The emulation need to be turend on and there are several keys available, for configuration.

CobraBox_Emulation	Turns the Cobra-Box Barcode emulation on
CobraBox_Brother	Turns the Brother barcode version of the Cobra Box emulation on. The key CobraBox_Emulation must be activated. Possible values: ON\OFF;
CobraBox_Init	This string is used to initialize the Cobra Box Barcode data stream, needs section COBRABOX
CobraBox_LeadInCharacter	Initalisation character für the COBRA Box Barcode sequence, usually the escape sign, needs section COBRABOX
CobraBox_StringTerminator	Character which is used to mark the end of the barcode usr information, needs section COBRABOX

Brother emulation for barcodes

See COBRA Box Emulation above .

PSi emulation for barcodes

Is by default turned on .

The following Sequences are supported:

<27>*zV	Type of barcode
<27>*zH	Height
<27>*zQ	Readable text
<27>*zS	Width
<27>*zO	Ratio
<27>*z<..	Barcode Information

Prescribe (Kyocera) emulation for barcodes

This emulation needs to be turned on, see W-ELP Control Center – Rule Assistant

Barcode error handling

The printer doesn't print barcode:

Use the file DEMO1.PCL for basic functionality testing.

Verify the ESC-Sequence. It should start with the <ESC> or the FreeEscape sign and end with an uppercase 'T'. The barcode data should directly follow after this termination character. If using FreeEscape, please turn the key FREE_ESCAPE in a triggered section of the ini-file on.

Another good way to start the search is to replace the <ESC> by any printable characters. The printer must print now the sequence as readable text. If not, then the sequence is definitely not received by the printer.

Windows doesn't print the barcode:
Don't use any enhanced printer driver. Enhanced will use PCL XL. Only PCL 5 is supported by BarSIMM/DIMM.

If you are using a Microsoft driver, switch to any printer builtin font, but not COURIER!

How to stop barcode printing:
Just send any other font selection sequence after the barcode message.

The blank problem:
Sometimes applications fill fields with blanks before or after the data. If you use an alphanumerical code like 3of9 or Code 128, this can cause a problem. We are aware of this, and are trying to solve this in the next versions.
If the field is left justified and fixed length, then just add <27>&p*fieldlength*X direct after the 'T' of the selection sequence. Leading blanks are always ignored, unless you add this sequence.

Formatting the German Post barcode:
If you want to print the code with the correct layout, use 124 as the P parameter and for example the 300 for the H parameter: <27>(s124p300h....T

LENGTH error in 2of5 interleaved
The number of printed digits are always even. If you use a check sum, then you need to send an odd number of digits, if not, so the number of digits must be even (dividable by 2).

Problems reading a narrow barcode:
In most lasers, the toner does spread more than it should. So you may either reduce the toner density, or better, use the B parameter to reduce the horizontal size of the bars, or the S parameter to widen up the spaces.

How can I position the barcode

PCL 5 provides the following EscapeSequences to do so: Esc&a#H (Horizontal) and Esc&a#V (Vertical). Esc stands Hex 1B or ASCII 27. The # is any number in 1/720 of an inch. So Esc&a720H will position the printer curser in the actual vertical position to the horizontal position 1 inch = 2,54 cm from the left logical margin.

If you prefer to position relative from the current position, than add in front of the values a plus of minus sign. Minus will move backwards, meaning horizontal to the left and vertical upper.

Surrounding the positionining by Esc&lS (push) and Esc&f1S (pop) will store the previous position and return back after the action too place. You may find at www.hp.com the full PCL 5 technical documentation.

Don't print the barcode on the very top
Especially when somebody tries to use an editor to get his first try print out, they intend to insert the sequences in the first line of text. As the barcode is printed from the Baseline to the top of the paper, you are often not really able to change the height. So we strongly advise for testing not to print the barcode in the first row.

39 barcode is much longer than it should be, typically as wide as the page
When you position horizontally the cursor using blanks to put the barcode at the right place, you must send the barcode selection sequence **after** sending the space characters to move horizontally. If you don't do that, the spaces are part of the barcode data and the barcode is much wider than expected (usually across the page).
If you can only send the barcode selection sequence at the beginning of the line, use the special 39 symbologies with no starting spaces (IDs 24670 and 24671). This symbology will not include the starting spaces in the barcode data.

For other problems please use our free of charge technical support. See last page for communication details.
Error number description

0	No data given to routine
1	Not enough memory on heap available
2	Leitcode of German Post AG uses 13 digits fixed length
3	The relation between the small bar to wide bar has to be between 2.0 and 3.0
4	Only the digits from 0 to 9 are allowed for this barcode
5	Identcode of German Post AG uses 9 digits fixed length
6	The length of the barcode string is out of bounce
7	The rotation degree is only allowed 0, 90, 180 and 270
8	For Codabar use only 0..9-$:/.+ and optional A..D for Start/Stop signs
9	For Code 39 use only 0..9 A..Z -. $/+%
10	Barcode information for Code 39 extended only allowed from hex 0 to hex 7f
11	PZN must be length of 6 digits.
12	PZN check digit 10 is not allowed
13	Requested barcode type number zero or larger then available
14	Code 128 characters valid from ASCII 1 to 134
15	Code 128 shouldn't start with a code switch character
16	UPS Barcode is 17 characters long
17	EAN 8 is 7, EAN 13 is 12, UPC A is 11, UPC E 6 or 7 and UPC128 19 characters long
18	EAN-E must start with number 0 or 1!
19	Illegal character for Code 11.
20	Length of UCC-128 Barcode must be 19 digits
21	Maximum input length for String is BARCODESTRLEN – 3
22	Barcode information for Code 93 extended only allowed from hex 0 to hex 7f
23	For Code 93 use only 0..9 A..Z -. $/+%

24 ZIP 4 + 9 must have 9 digits, ZIP 4 + 5 must have 5 digits, ZIP 4 + 7 must have 11 digits
25 FIM characters A..D. no other entry allowed
26 French post barcode, first two characters must be RA or RB then 8 digits
27 2of2 interleaved with check sum requires an odd number of digits
28 2of2 interleaved without check sum requires an even number of digits
29 The relation for Codabar between the small bar to wide bar has to be between 2.25 and 3.0
30 The length of USPS 25, 10 digits Tray label is 10 digits
31 The length of USPS 25, 8 digits Sack label is 8 digits
32 Invalid character in Kix or 4state data, use only 0..9 and A..Z
33 Invalid length Kix data, min. 6 character required
34 Internal Error, Kix or 4state definition chars not valid
35 The Australia 4state Barcode must be minimum 8 DIGITS long (DPID) if longer then 8 characters, then you need to separate the CustInfo from DPID with a colon, no additional spaces allowed!
36 The Australia 4state 37 Barcode uses only 8 digits! Rest is ignored
37 The length of the customer info is too long. For the 52 Type of code it is only allowed 5 chars or 8 digits, the 67 version 10 char or 15 digits.
38 The colon is not allowed in the 4state data stream
39 The singapore 4 state barcodes consists of either 6 digits or 4 alpha-numeric characters (BRS Letter)
40 The Danish PTT barcode uses 10 digits, or 2 characters CC,CK,CO,CU and 8 digits.
41 The Royal Mail Barcode is defined with 0..9 and A..Z characters and with a length of minimum 7 and maximum 9 characters.
42 max. 90 rows and 30 columns
43 not enough memory
44 maximum codeword capacity is 863
45 Illegal Codeword in PDF 417
46 Too many user data for PDF 417
47 Code 128 function does not apply, e.g. shift, FNC3, FNC2 and FNC4 are not used while stying in Code C.
48 The user data length information does not match to the provided information. Hex 00 is not a valid character!
49 See manual, all items need to be sepratated by a comma
50 Mode is currently only supported 2 and 3
51 Not enough memory to set internal maxicode variables
52 The Zip code information is not in the specification. See table in the Maxicode description section
53 Country code must be 3 digits.
54-58 See error.log file for detailes description
59,60,61 Internal Data Matrix error, please report

ASCII table

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
32	‘ ‘	!	“	#	$	%	&	‘	(	)	*	+	,	-	.	/
48	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
64	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
80	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
96	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
112	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	

In order to get the ASCII value of a character, the column header value must be added to the row header value. Example: T = 4+80 = 84

Hex table

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
0	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
16	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
32	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
48	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
64	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
80	50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
96	60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
112	70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F

In order to convert for example an ESC String into HEX values, proceed like this:

1. Look up in the ASCII table for the characters ASCII value.
2. Look up in the HEX table for the Hex representation of the ASCII value.

Example:
<27>(sp10hsb4099T -> 0B 28 72 70 31 30 68 72 62 34 030 39 39 54

If your input field for ESC sequences doesn’t offer the needed length, then simply split the sequence into two ESC sequences, like <27>(sp10H and <27>(ssb4099T.

Note:
You will find more PCL sequences and the full ASCII and Hex table on page 37.

FREE-ESCAPE feature

PCL codes always begin with the non-printable Escape code (Hex: 1B, Dec: 27). Some systems can not use or send binary data to a device. Binary means any character other than a letter, punctuation or a digit. Such systems include Mainframes where printers are connected to terminals, and IBM AS/400 computers. It can prevent you from using the HP PCL language, and from using Barcodes. With the FREE-ESCAPE feature, the Escape code has a synonym, a user-defined Escape Code or Alternate Escape Code (AEC). That character acts exactly like the standard Escape Code when found at the beginning of a regular PCL sequence.

FREE-ESCAPE is smart enough to ignore the EAC if it is found as pure data. You can also mix regular Escape Codes and Alternate Escape Codes. The AEC can be any character.

There is a new escape sequence to change the Alternate Escape Code:
<Esc or AEC>**#J

Where # is the ASCII code of the new AEC: Examples: 34 (‘’), 35 (#), 36 ($), 47 (/), 92 (\), 63 (?), 123 ({), 125 (}), 124 (|), 126 (~).

Default value for the AEC is the TILDE ‘~’. If you can’t send down the ESC sign and you don’t want to use tilde as the AEC sign, then select any other sign for AEC from above list using the following ESC-sequence: ~**#J and enter for # the ASCII value for ASC.

Another method to define the AEC character is to use the KEY FREE_ESCAPE_CHAR in the ini command file. Here you can also turn on and off this *ELP* function.

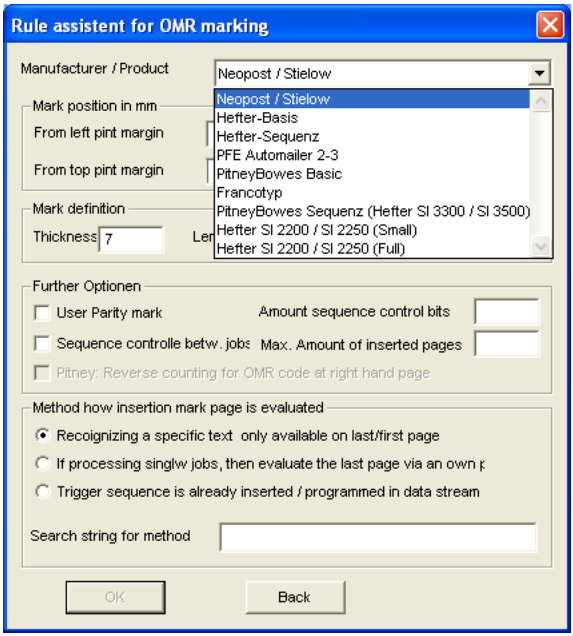
NOTES:

- By default ELP has this function turned OFF! See section GLOBAL in the ini-file.
- Is the Function turend on, then the AEC can´t be part of the user barcode information. So for example in Code !28 or EAn 128, this user data for barcoding is illegal: 123~456. In that case you need to reassign the AEC sign to a character whch is never used.

Overview of all Barcode INI-File keys

BARCODE keys	
Free_Escape	Turns the Free-Escape function off and on. If the data stream is based upon the German ISO 7bit it is better to set the Free-Escape function turned off.
Free_Escape_Char	Unless blank, all characters can be defined as a second alternative Escape Sign for PCL commands.
Barcodes	Disables the barcode functionality, default is turned ON and ELP emulated the industrie barcode standard for laser printers,
Barcodes_2D_OldVersion	Turned on, a possible CR-LF without previous data will NOT be part of the barcode. Also any CR-LF will end the barcode is ELPs voter did not detect a PCL 5 data stream;
Barcode_EraseStartStop	The argument needs to be exactly 2 characters. If the barcode information starts with the first and ends with the second character, the two characters are erased from the user information
BarcodesPostScript	Enables ELP also to check PostScript print files for barcode sequences and user data. Default is this function turned OFF. Can only be used in section GLOBAL or in the user and or primnter named sections.
BarcodesPostscriptScalefactor	You may set any factor which is only used for the postscript barcode size adaption. The X and Y sizing are both commonly set.
2of5AutoLenAjustment	If turned on, a leading 0 is added, if barcoe data doesn't match the even/odd amout of digit criteria. Default turned off and Error 28 is printed if len of user information doesn`t match.

OMR Barcodes


Rule assistent for OMR marking
Manufacturer / Product
Neopost / Stielow
Neopost / Stielow
Hefter-Basis
Hefter-Sequenz
PFE Automailer 2-3
PitneyBowes Basic
Francotyp
PitneyBowes Sequenz (Hefter SI 3300 / SI 3500)
Hefter SI 2200 / SI 2250 (Small)
Hefter SI 2200 / SI 2250 (Full)
Mark position in mm
From left pint margin
From top pint margin
Mark definition
Thickness 7
Further Optionen
User Parity mark
Amount sequence control bits
Sequence controlle betw. jobs
Max. Amount of inserted pages
Pitney: Reverse counting for OMR code at right hand page
Method how insertion mark page is evaluated
Recoignizing a specific text only available on last/first page
If processing singlw jobs, then evaluate the last page via an own p
Trigger sequence is already inserted / programmed in data stream
Search string for method
OK
Back

OMR Barcodes are used for mailing documents with variable page sizes. The barcodes are used to ensure, that the documents are correct separated and fed into envelopes by Folding and Inserting Systems.

The OMR barcodes tells the inserter to collect the actual drawn piece of paper or to insert the actual plus the already collected pages into an evelope. In order to make the barcode safe, a parity bit may be added. Also an automatic pager numbering ensures that the inserter does not draw several piece of paper at once.

The OMR functionality with ELP provides an easy to use, safe and fully automated way, for OMR barcode printing. You may use for nearly all functions the Rule Assistant menu OMR – SET.

The following inserter brands are supported: Stielow, Hefter, Pritney Bowes, Francotyp-Postalia, Kern and PFE. Please note that other manufacturer like NeoPost etc. often also support the same type of barcode printing / reading.

The OMR lines are by default 7.5 mm long, 0.5 mm wide and distance between each line is exact 4.32 mm. If this specification does not fit your inserter requirements, use the propriate command keys: OMR_LineWidth, OMR_LineHeight and OMR_ LineDistance. All values are mesured in millimeter xxxx.xx.

WHne the code is read alongthe long page side from top to buttom, use the 270° orientation.

Like the job splitting, *ELP* needs a trigger in form of a special Escape Sequence: <Esc>)s-990Z on each (last) page to be inserted into the envelope.
Actually the method of inserting this trigger on that last page is exactly the same as described aboves chapter: job splitting.

Again, if you are not able to insert direct this sequence into the data stream, like for example with MS Word inserting the field "PRINT 27 ")s-990Z", use SEARCH_TEXT keys to find a piece of text, which is only used on the last page, and then the ADD_KEY to tell *ELP* to insert the Control Sequence.

For activating OMR Barcode use the key: OMR_ENABLED and turn it on. Usually the OMR function is dedicated to a specific printer queue, therefore you may first add the queue control in form of a "NEW SECTION" to the ini-File. Those commands can also be placed into any searched or triggered section.

Once OMR is enabled, the following *ELP* keys are searched for, in every activated Section.

OMR_Enabled	Needs to be turned ON for OMR support
OMR_Position	X#,Y#,Orientation# Defines the position of the top left corner of the OMR Barcode, when printed in standard print direction. The X and Y entries are in mm and separated by a comma. As a 3rd comma separated value, the barcode printing orientation can be entered in 90 degree steps: 0, 90, 180 and 270. The printing position is then still top left, but rotated!
OMR_Type	See table below
OMR_MaxCollectPages	Defines the maximum possible pages to be inserted into an envelope. Once reached this amount, the insertion command is performed.
OMR_LineHeight	Height of the OMR barcode line in mm; Default 7 mm 1 inch is 24.5 mm
OMR_LineWidth	Length of the OMR barcode line in mm; Default 0.5 mm 1 inch is 24.5 mm
OMR_LineDistance	Distance in mm from one OMR mark to the next; Default 4,23 mm 1 inch is 24.5 mm
OMR_CollectJobs	This key enables the paper sequence control mechanism, for several print jobs. See below for further details. Default OFF, for Hefter_Sequenz needs to be turned on, ignored for Pritney Bowes.
OMR_PrintOnPageSide	May only be used in duplex printing data streams, in order to put the marks only on the front or back page. 1 front page only 2 back page only 0 all pages

	Notes: Should be only triggered for duplex data streams, see last example below. Used on the back page, then make sure that always an odd amount of print pages (sides) are printed.
OMR_UseReadPageCounter	Provides a second methode to put the insertion mark on the LAST(!) page. Through parsing the data stream into ELP, the amount of pages have to be counted. And the OMR insertion mark is automatically added on the last page. If the key OMR_PrintOnPageSide is used with front side, that the insertion command is put on the last front page. See last example in this chapter. This method is only applicable if each job is a single letterr invoice etc. If this method is used, then PREPARSING=ON needs to be set in rule GLOBAL and the OMR function needs to be triggered by a SEARCH_ or TRIGGER_ activated rule.

In Addition the following commands are available for the Stielow and PFE Automailer 2 and 3 implementation:

OMR_SequenceControl	This key is used to enable an OMR page counting. There are 3 possible entries: 2 (1 bit), 4 (2 bits), 8 (3 bits) 16 and 32 (5bits). For print job the page number 0 is the startup number, unless the key OMR_COLLECTJOBS is not turned on. HEFTER-Sequenz is automatically set to 2 PitneyBowes_Sequenz it is automatically set to 8 PFE_AUTOMAILER_2_3 is automatically set to 5 bits Franctyp is set to 3 bits.
OMR_Parity	If this key is used and turned on, *ELP* adds a parity bar right before the stopp bar. In this case, the amount of printed bars will always be even. PitneyBowes and PFE_AUTOMAILER_2_3 are automatically turned on and any provided value in the ini-file is ignored.

The next commands are available for the Stielow only.

OMR_ADDMOVEOUT	Stielow only!: Turned on, adds the Move Out stoke on all(!) pages, meaing that the so marked pages are not inserted in the envelope but moved out to the exit tray. Therefor the variable #OMR_ADDMOVEOUT# needs

	to be set to 1, most likely using an OutSearch key. Once the variable is set, they are used for the complete job, or until the variable is set to 0 again! If needed, split mail merge documents.
	For example:
	`[Global]`
	`PreParsing=ON`
	`[Move out more then 8 pages]`
	`Trigger_Binary=1`
	`Trigger_Variable= #PREPARSEPAGECOUNT#>8`
	`Variable=OMR_ADDMOVEOUT:1`

OMR_AddOnFeederBits	Integer Value of how many feeder for fixed addon documents are available, max 5 are allowed. Every feeder does reflect one stroke. The variable #OMR_ADDONFEEDERBITS# defines if and from which feeder is drawn. The content of the variable is the feeder number times 2. The first feeder is then 1, the second 2, the third 4, 8 and 16. If for example 2 page from tray 2 and 4 needs to be drawn the variable value has to be 2 + 8 -> 16. The variable is usually defined upon information of the data strem and is set in the same way as above.
OMR_CollectBar	Touggles if the collect bar is a bar or a space. Default is turned OFF and the feeder command is interpreted as a bar. Turned ON, the collect signal is a bar on second place, and no bar for feeding into the envelope.;
OMR_SafetyLine	Turned on, the OMR for Kern will add the safety line at the end of the barcode. See variable: #OMR_SAFETYLINE#

Additional Variables for using PFE inserters. They can set by special escape esequences within in the document, and they will be rested after the page is printed, or can be set externally if each job contains only one document.

#OMR_PFE_SELECTFEED#	The variable defines if the mark for selcet feed needs to be printed: Variable 1, 2 or 3 is possible. The marks will be not printed (even no space steps) when the value is minus. By default they are printed. To turn it off enter the following key into the ini-File rule GLOBAL: variable=OMR_PFE_SELECTFEED:-1 to turn it on set the variable to 0. To set it either use the OutSearch method or the new ELP PCL equenzens Esc)s-989Z for Feeder 1, Esc)s-988Z for

	Feeder 2 and Esc)s-987Z for Feeder 3 / stapling
#OMR_PFE_Divert#	The variable defines if the job needs to be send to a divert bin. This marks must come on the first page. The 3 binary marcs must be set according to PFEs definition with the value from 0 to 7.

Additional Variables for using Hefter SI 2200 and SI 2250, Pitney Bowes Sequence and Hefter SI 3300 and SI 3500: Same way desribed as above. Special marks will be placed only on the page with the inserter (Group end) mark.

#OMR_DONTCLOSE#	If this variable is set as any non zero value, the stroke will be set on the page with the insertion command. If it is on the first pagem then the command needs to be set on the first page, if it is on the last page, you have the full document to set it.
#OMR_PFE_SELECTFEED#	Same as above, any non zero value will draw a page from the feeder
#OMR_ADDMOVEOUT#	Same as above, set as well only on the insertion / group end page.

Additional Variables for using Kern: Same way desribed as above.

#OMR_SAFETYLINE#	If set to content ON, the Kern OMR barcode will add an safety line at the end. Can be set with the keys: Variable or OMR_SafetyLine
#OMR_ADDMOVEOUT#	Same as above, set as well only on the insertion / group end page.

Here is the listing of the supported machines or strokes:

Neopost / Stielow	Start – Insert [- Move Out] [- Feeder Bits] – [Sequenz Control] – [Parity] – Stopp
Hefter – basis	Start – Start – Insert – Insert
Hefter Sequenz	Start –Insert – Sequenz Control – Group -
PFE Automailer 2-3	Start – Insert [– Parity] – 3 Feeder Bits - Sequenz Control
PitneyBowes Basic	Start – Safety – NOT EOC – NOT BOC – Parity – Timing 1
Francotyp	Start – Insert – Stopp because of too many pages [- 2 Feeder Bits] [– Sequenz Control] [– Parity] - Stopp
PitneyBowes Sequenz Hefter SI 3300 / SI 3500	Start – Safety – NOT EOC – NOT BOC – Parity – Timing 1

	Optional: – Feeder 1 – Feeder 2 – Stapling – Timing 2 Optional: – Sequenz Control – Timing 3
Hefter SI 2200/SSI2250 small	Start –Insert – Parity – 1 Feeder Bit – Sequence Control
Hefter SI 2200/SSI2250 full	Start –Insert – Parity - Don'tClose – 1 Feeder Bit – Halt – Sequence Control
Kern	Start – Insert - Move Out – 4 Sequence Control Bits – 2 Match Bits [- Safety]
Other or Modifications	Please ask.

As indicated above, there are two modes for printing OMR barcodes:

1. Within one huge print job, then do not use the key OMR_CollectJobs
2. One job after the other, but all jobs are collected and then moved over to the Inserter. For this case use the key OMR_CollectJobs!

For the second method be sure, that nobody else printes a job inbetween, or, if doing so, that this job is not printed through the OMR enabled Queue AND of course prints to another out tray. Otherwise the inserter will stop, when a pagewithout OMR code is inbetween.

Once the key OMR_CollectJobs is used, *ELP* will store after each print job the actual Sequence Control Number number of the last page into a file called like this: PrinterName.OMR in the forms directory.

You may also use the ELP_Command R#; for generation copies of each page. Also you may insert different forns etc. The routine will handle to put the insertion command on the last page of the last copy. Never use ELP_Command K#;

VERY IMPORTANT when using OMR codes in collection job mode:

Never activate in one Queue different Types of OMR Codes, unless you do not use the key OMR_CollectJobs .

Once the Inserter is finished with a complete staple of paper, it may reset. So you must ensure, that for the next job the OMR page counter is set to zero! This can be done by erasing the file PrinterName.OMR in the "WELP\forms" directory.

To automate this, you may write a simple batch file, which does remove that file. The content of that batch file is most likely this:

del c:\programme\welp\forms\PrinterName.omr

In order to perform such a command, use for example NotePad, type the command in the first line, and store it in a filename with the ending .bat instead of .txt. Then you may generate a link to that file on your desktop and every time the file needs to be erased, simply double click on the link icon.

Of course this file needs to be erased as well every time your envelope inserter device is powerd on. But *ELP* itself is deleting it, just in case the stored value would have been zero.

The variables #OMR_PFE_SELECTFEED#, #OMR_PFE_DIVERT#, "#OMR_OUTTRAY#, #OMR_ADDMOVEOUT#, #OMR_DONTCLOSE# and #OMR_ADDONFEEDERBITS# can be used on a document level. Once set for the job, they will be used to add the related function on the actual page / last page with the insertion mark. They are all set back to zero after they had been used.

In the option of the feederBits, we recommend to add the Variable the first time into the rule GLOBAL like this:

```
[GLOBAL]
;….
Variable=OMR_PFE_SELECTFEED:0
```

So the feeder bits will be always added to the bar list, even on the first pages, where they are not really needed. On Pitney/Hefter, they will be added only as bars on the pages with the nserion mak (last one) om all other ones they are moved as blanks

This results into 2 ways of using them:

1. The print job does have only one document, maybe it was splitted before.

In that case any triggered rule can be used, like that:

```
[If less then 3 pages add a sheet from the feeder]
; Note: PreParsing must be set ON in the rule GLOBAL
Trigger_Binary=1
Trigger_Variable=#PREPARSEPAGECOUNT#<3
; For Francotyp 0,1,2,3 is possible.
Variable=OMR_PFE_SELECTFEED:1
```

2. If all mails should contain one or 2 pages from the feeder, then simply use a trigger, which can be found on all pages:

```
[Add on all letters the 2 pages from feeder]
; normally this can be found on all windows based stream
; on top of any page
OutSearch_Binary=\x1B&l
Variable=OMR_PFE_SELECTFEED:3
```

Note: Outsearch method will only work, if the pages contains more the 2K of data.

Another method is to add the ELP special escape sequences in the data stream for drawing selective papers:
Esc)s-989Z for Tray one and Esc)s-988Z for Tray 2:
An example:

```
[Add after every letter from envelope feeder tray 2]
; just we found partnumber XXXX on the invoice
Search_Windows_New=XXXX
Add_Binary=\x1B)s-988Z
ReadOnlySearchkeys=ON

[Add after every letter from envelope feeder tray 1]
; just we found partnumber YYYY on the invoice
Search_Windows_New=YYYY
Add_Binary=\x1B)s-989Z
ReadOnlySearchkeys=ON
```

If this methos is also not possible, the job needs to be splitted.

As an example mainly for Stielow find below a part of an ini-file:

```
[NameOfPrinterQueue]
; For every print job, coming through the queue "NameOfPrinterQueue"
; the OMR function is turned on!
OMR_ENABLED=ON
; The top left corner of the OMR Barcode is 40 mm from top and 50 mm
; from the left page marging. The 0 indicates, that the default
; printing direction is used: | |  |||
OMR_POSITION=40,50,0

; Enable Parity checking to enhance the readability safety
OMR_PARITY=ON
; use two bits for OMR the page numbering
OMR_SEQUENCECONTROL=4


[Search Page which needs to get the envelope feeding signal]
; the data stream hasn´t got the Trigger Sequence on every last page,
; ELP Searched for a unique word on the last page and
SEARCH_WINDOWS=MwSt. Betrag
; add the trigger right behind.
ADD_BINARY=\x1B)s-990Z
ReadOnlySearchKeys=ON
```

Example for PFE Mailers incl. continuous Form Sequence Numbering.

```
[GLOBAL]
. . .

OMR_Enabled=ON
OMR_Type=PFE_AUTOMAILER_2_3

; Marks are on the left hand of portrait A4 page in Y direction
; at position 20cm from left, 15cm from top and in 270° print
; direction, which will then move the bars down the page.
OMR_Position=200,150,270
; therefor line height is in Y direction (original portrai)
OMR_LineHeight=0.5
; line width is in X directon
OMR_LineWidth=7
; Line distance 5 mm in Y direction down the page, as 270°
OMR_LineDistance=5
; Save last Sequence Number values
OMR_CollectJobs=ON
; The PFE OMR implementation, does set automatically the
; parity to ON, 5 bits Form Sequence and 3 bits Select Feed

; Set to add additional inserst from tray 2
Variable=OMR_PFE_SelectFeed:2
```

Note: The variables OMR_PFE_SelectFeed and OMR_PFE_Divert are set to 0 after they are used. So both items can only be used within one job. They can be searched by informations in the datastream and then be set, but only once. So to work wth them, larger jobs need to be split into single documents like invoices or delivery notes. On request, this can be changed. So you do not need to split the job.

Example for Stielow again with single invoice jobs, duplex and automatical insertion mark on the last page.

```
[GLOBAL]
ELP=ON
OMR_ENABLED=ON
OMR_TYPE=STIELOW
; maximum 8 sheets of peper can be inserted
OMR_MAXCOLLECTPAGES=8
OMR_CollectJobs=ON
OMR_PARITY=ON
OMR_POSITION=7,155,270
OMR_SEQUENCECONTROL=8
OMR_LineWidth=7
OMR_LineHeight=.5
OMR_LineDistance=4.23
; in printer DIMM mode set ELP_MAX_HEAP to 1250000
ELP_MAX_HEAP=10000000

[Get amount of pages]
; search for an information whoch can be found on every page
; in order count pages through reading data in.
; Maybe also search for terms like PAGE or Invoice No.
; here for the printer command Portrait is searched.
Search_Binary=\x1B&l0O
Counter=#MyPageCounter#

[Inform the OMR process which is the last page]
Trigger_Binary=1
OMR_USEREADPAGECOUNTER=#MyPageCounter#

[Test for duplex job]
Trigger_Binary=1
Simplex_duplex=1
; this section is for a duplex job true
; double the max page counter to be inserted in an evnvelope
OMR_MAXCOLLECTPAGES=16
; Only print OMR code on front page
OMR_PRINTONPAGESIDE=1

[Test for amount of pages]
Trigger_Binary=1
Trigger_Variable=#MyPageCounter#>#OMR_MAXCOLLECTPAGES#
; if too many sheets, then do not print OMR and send job to
; different out tray
OMR_ENABLED=OFF
ELP_COMMAND=C1M4;
```

Error reporting

Especially the *ELP* part of the Server Software can be very complex in execution. The product was tested very carefully, but as always, nobody is perfect.
So any problems should be reported by email to your local distributor (PPADMIN info box). For address see PPAdmin -> License Tab -> About.

I order to report a problem, please proceed the following steps:

1. Set ELP into the debug Mode: Start PPAmin -> open ini-File register tab -> click button Rule assitent -> turn protocol to ON at top left of the window
2. Reprint the job once
3. Generate an eMail and describe briefly the problem.
4. Attach the following files from the forms directory:
   in_data.prn
   out_data.prn
   log_file.txt
   all used ini-Files
   All used macros and Forms
5. Send the eMail to the listed Adress at PPAdmin -> License Tab -> About.
6. Turn the protocol function OFF again, as it eats a huge amount of system resources.

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Technical support

For questions, inputs, additional support or any other reasons, please contact your local distributor. The address can be found in the info box with PPADMIN at the license register.

Also you may have a look at:

1. The Question and Answers document located in the Manual section of the program start selection: “Enhanced Laser Printing ELP”

2. Chapter examples the administration document

3. If you need personal help, please contact your distributor listed in PPAdmin’s license tab -> info box.

Thank you for looking and maybe even using our product.